

# Emerging Technology

## Helical Reaction Hydraulic Turbine

The Gorlov Helical Turbine (GHT) is a newly developed technology that is relatively inexpensive, ecologically benign, and provides a reliable source of electricity by extracting the kinetic energy from flowing water. It is designed for hydroelectric applications in free flowing watercourses, which means it does not require a dam or other obstruction to the natural current flow. The GHT is a cross-flow turbine with airfoil-shaped blades which provide a reaction thrust that can rotate the GHT at twice the speed of the water flow. It is self-starting and can produce power from a water current flow as low as five feet per second (fps), with power increasing in proportion to the water velocity cubed. Due to its axial symmetry, the GHT always rotates in the same direction, even when tidal currents reverse direction. The standard model GHT (1 meter in diameter, 2.5 meters in length) can be installed either vertically or horizontally to the water current flow, in waters as shallow as four feet in depth. A single standard model GHT should produce from 1.5 kW in a water current flow of three knots (5 fps, 1.5 mps) to about 180 kW in a water current flow of 15 knots (25.35 fps, 7.72 mps). Testing of the GHT has demonstrated superior power efficiency (35%) in free flowing water currents compared with other turbines used in free-flow, unconstrained water currents. The GHT can also be used as a wind turbine.



### Contact

*GCK Technology, Inc.  
425 Soledad  
Suite 600  
San Antonio, TX 78205-1511*

*Contact: Ed Kurth  
Telephone: 210-496-5902  
Email: [kurth@gcktechnology.com](mailto:kurth@gcktechnology.com)*



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